Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
INQUIRY REGARDING CARRIER CURRENT SYSTEMS, INCLUDING BROADBAND OVER POWER LINE SYSTEMS	)	ET Docket No. 03-104
	)	
and	)	
	)	
CARRIER CURRENT SYSTEMS INCLUDING BROADBAND OVER POWER LINE SYSTEMS AMENDMENT OF PART 15 REGARDING NEW REQUIREMENTS AND MEASUREMENT GUIDELINES FOR ACCESS BROADBAND OVER POWER LINE SYSTEMS	)	ET Docket No. 04-37
	)	
and	)	
	)	
AMENDMENT OF PART 15 REGARDING NEW REQUIREMENTS AND MEASUREMENT GUIDELINES FOR ACCESS BROADBAND OVER POWER LINE SYSTEMS	)	ET Docket No. 04-29

To: The Commission
Reply Comments to Notice of Proposed Rule Making (04-37)

Reply Comments to Notice of Proposed Rule Making (04-37) by Satius, Inc.

In review of the Notice of Proposed Rule Making for Carrier Current System for Broadband Power Line (BPL) Communication Systems in ET Docket No. 03-104 and 04-37, Satius did not find reference resolution bandwidth to be used when emission is measured under part 15.109 and 15.209 with a spectrum analyzer. Therefore this amendment to comments shall be acceptable for late filing and treated as filed comments on time.

SUPPLEMENTAL COMMENTS OF SATIUS, INC.

Satius, Inc. ("Satius"), hereby submits late-filed comments on the above-referenced proceedings. Satius requests leave to submit these late-filed comments and asks that FCC accept them into their consideration because the comments are in the public interest and predicated on recent technological developments by Satius occuring after the submission of the original comments.

I. Introduction

In review of the Notice of Proposed Rule Making for Carrier Current System for Broadband Power Line (BPL) Communication Systems in ET Docket No. 03-104 and 04-37, Satius did not find reference resolution bandwidth to be used when emission is measured under part 15.109 and 15.209 with a spectrum analyzer.

II. SATIUS recommendations to the NPRM

1. The resolution bandwidth of a spectrum analyzer needs to be 9Khz or 10 Khz for all frequency bands when emission is measured under part 15.109 and 15.209 for Carrier Current Systems. To be fair and reasonable for each Carrier Current System in all frequency bands, the 9 Khz and 10 Khz resolution bandwidth and/or video bandwidth shall be used for emission measurements. It is clear that OFDM or Spread Spectrum technologies are being used for BPL systems for access or in-house communications ranging from 10-30 Mhz bandwidth whether below 30 Mhz carrier frequencies or above the 200 Mhz carrier frequencies are used the resolution bandwidth and/or the video bandwidth shall be the same for emission measurements under part 15.109 and 15.209 because the communication bandwidths are close to the same using any of the carrier frequency bands.

2. Satius is proposing to adapt a RELAXING rule, which says: If any Carrier Current System technology is capable to reduce emission at some of its transmission frequencies by at least 30 dB for interference control and create lower than -100 dBm level of harmonics emission measurement (measured at 30 meter from any Carrier current transmitter) and thereby will not interfere with any licensed device in the area of operation then FCC would allow 10 dB

higher emission from such devices than what its part 15.109 and 15.209 rules allow as long as such unlicensed devices will not continuously interfere with any licensed user.

3. The definition of Access BPL under section 10 is acceptable for Satius. No changes are recommended.

III. SATIUS REVOLUTIONARY TECHNOLOGY

In the last couple of years there has been a major push for Broadband Power Line Communication (BPL) for internet services. I, Charles Abraham, through Satius, Inc. and our engineering talents have been working diligently, developing, patenting, and licensing Power Line Communication (PLC) devices for the past 20 years.

Our advantages are simple:

1. Satius has carefully studied and comprehended the real physics solution to communicate over power lines efficiently without causing interference,
2. Satius is capable of delivering ten to hundred times faster speed than that of other BPL solutions,
3. Satius' unique and patented physics solution does not interfere with any licensed user and
4. Satius technologies are able to deliver a wide spectrum of applications, such as internet, cable TV, telephone, security and automated meter reading, simultaneously over power lines, as a universal last mile solution.

There are two major problems other BPL competitors have today:

1. Most other BPL solutions have large signal harmonics that interfere with the entire RF frequency band causing disruption to TV and FM radio receivers.
2. Most other BPL solutions only support narrow bandwidth and are therefore too slow to meet internet traffic demands alone, without mentioning other applications; as a result, they will become the bottleneck as service demands accumulate at the utility/internet providers entry points.

In 1996 a Company tried in the UK to deploy BPL systems. In 1997 people of England, according to the UK newspaper, filed many complaints that they were neither able to watch their

regular TV programs nor able to listen to their radios due to serious interference from that Company BPL devices. Consequently that Company BPL products were shut down by the UK government.

In 2000 another Company installed 40,000 homes with BPL devices in Düsseldorf, Germany, according to German newspapers, and people of Germany also filed many complaints about severe interference to their regular TV and radio programs from this Company BPL devices. Consequently this Company BPL products were shut down by the German government.

Today, Satius finds many BPL competitors are fighting with the FCC to sell "what they have", they are trying to get 2-3 years extension for their current products to change it while they have not even deploy their current BPL devices and try to avoid possible regulations that reveal their technology weaknesses.

Many competitors' BPL products have lots of and very high signal harmonics if deployed on the field. FCC knows it and FCC wants to test them on the field. These harmonics can harmfully interfere with any licensed radio systems like the TV broadcasting receivers, FM radio receivers, and other analog or digital RF systems like the aircraft carrier navigation systems. The Armature Radio Organization continuously complains about the competing BPL systems to be very noisy for them and according to them their BPL harmonics can be received a mile away from the sources. These competing BPL devices harmonics due to incorrect matching to the power line characteristic impedance will change in time and in location. These mismatches result in different time and locations harmonic multiplications and/or cancellation at different frequencies. In layman terms, this could mean serious interference into the aircraft carrier navigation system at different time and location specially if a large number of such BPL devices will be deployed even a mile away. The examples of UK and Germany are very scary to USA, because if such BPL deployments are allowed and/or FCC allows such BPL devices to be deployed without an field emission test, the people in USA will stop BPL companies and our security with aircraft carriers and other security systems will be in jeopardy.

Physics works only one way and Satius holds the solution. The solution delivers very high speed data to homes over the last mile based on our patented BPL technologies. Business only works one way and Satius knows the direction: deployment of new technologies does not interrupt or add costs to existing services and infrastructures.

The emission from other BPL devices changes over times and locations. It has been observed that along the power line pathways, emission from these competing BPL devices can be as much as 100 times above the limit!

Satius physics solution is the only solution that can meet consumer demands:

1. Satius technologies do not have harmonics;
2. Satius technologies do not have IM (inter-modulation) products;
3. Satius signal emissions are low and stable. They do not vary dramatically over times or locations;
4. Satius technologies can reach speeds comparable to fiber optics;
5. Satius technologies communicate directly through the transformers to make sure such mid-voltage installations less costly and safe.

Consequently, Satius agrees with most of FCC recommendations to make sure that BPL will not cause any interference to licensed users because Satius believes that this is the only way to enable widespread acceptance of the new technologies. Without this there is no marketplace.

Satius conducted a successful field test emission measurement with its BPL technology and receiving a validation from an FCC authorized Lab that Satius technology complies with the newly proposed FCC rules on any field and Satius technologies do not interfere with any licensed devices including the aircraft carrier radio navigation systems.

IV. REPLY COMMENTS

Several Wireless organizations are requesting more studies on BPL to prove its weaknesses like significant signal harmonic emission on competing BPL products.

Satius will file shortly its FCC authorized Lab measurements that prove that Satius can meet the newly proposed FCC rules. Satius coupled into the 3 phase 14.4 KV power line at only one phase to GND and coupled the another BPL modem into the 480 V 3 phase power line at only another phase to GND and received between 35-40 Mbps throughput rate speed through the distribution transformers. Satius prototypes already prove longer distances of communication through the transformers and over the power line than any other competitors and Satius expects to get even longer communication distance.

Satius is offering for over a year to field test in real world Satius last mile technology that does offer higher speeds, communicates through the transformers and does not have harmonics to several BPL companies, ARRL organization and to the FCC.

Consequently, there is no need for additional testing and studies of BPL technologies because Satius has already the solution and is willing to show it to anyone upon reasonable requests.

Comments were filed by UPLC that "UPLC also agreed in principle with the interference mitigation rules proposed by FCC".

Last year when Satius discussed this matter with UPLC, we were told that BPL companies do not have harmonics, but such a solution of shutting down certain frequency bands to avoid harmful interference into a licensed band would not be possible because IM products would fill the shut down bands. So, we concluded that BPL competing companies do have serious harmonics, which generate IM products.

Satius has the following questions:

1. Why is UPLC promoting mitigation rules if UPLC knows its BPL companies can not meet the requirement to shut down certain bands without IM products anyway?
2. Does this mean that competing BPL companies emission from the shut down frequency band (or mitigated) will be as high as the fundamental transmission signals? In that case, FCC should ask BPL companies to mitigate the emission of the signals not just the transmission signals.

Comments were filed by UPLC that "UPLC ask FCC for a 2-3 years before the current BPL units will be replaced by new ones that will meet the new FCC rules".

Again, physics works only one way. That way is patented by Satius, Inc. The other ways are tried by lots of companies in the past 20 years without success.

Due to non-linear matching to the power line characteristic impedance, harmonic emission can multiply each other to another frequency band and create very large interferences even at security related frequency bands. The example in Germany and UK are real and can happen in USA.

Therefore, our government should address this issue and decide whether they should test and enforce the new FCC regulations from day one in order to protect security of our Nation. Consequently, the BPL industry knew these issues years before and therefore their request for this 2-3 years delayed approach for their current units should be denied, because it is not the best interest to our nation's security and to our people.

Comments were filed by UPLC that "UPLC suggest a pragmatic approach that would measure the average emission from BPL, rather then focusing on the emission from each BPL device".

Again, due to non-linear matching to the power line characteristic impedance some BPL devices at different time and location will have 100 times emission than what it is allowed. This can happen to every non-linearly matched BPL device at different time and location not just one. Satius has been advertising its technologies on its website for years and that Satius has the only technologies which can match the power line characteristic impedance at any time and location therefore Satius does not have harmonics, or any IM products and Satius fundamental emission is stable at any time and at any location.

Consequently, the BPL industry knew these issues years before and therefore their requests for this pragmatic approach should be denied, because it is not for the best interest of our nation's security and of our people.

Comments filed by NTIA requesting measuring instead of 1-4 meters above ground, NTIA recommends measuring BPL at the height of the power line.

Due to non-linear matching to the power line characteristic impedance by competing BPL companies it can happen that the emission will be higher above the power line. The question remains who will be that brave person who will go with an antenna on the pole to measure above the mid-voltage power line? As we know depending on the location and humidity level, mid-voltage power lines can arch static discharge several feet away from the power line to even kill or injure a person. Satius is not against doing such measurements below 80 Mhz carrier frequency, which has longer wavelengths than the higher frequencies.
Satius believes that its technologies emission level is about same above or below or on the side of the power line as it is reported by the FCC authorized Lab. However measuring close to the mid-voltage power line carrier frequencies above 200 Mhz is going to be a serious problem since such wavelength is less then 4 feet long. Furthermore the coaxial cable that is connected between the spectrum analyzer and the antenna will be an antenna itself and at different angle such antenna factor will be a challenge to calculate especially above 200 Mhz carrier frequency.

Comments filed by competing BPL companies including Jay Birnbaum, VP of Current Communications Group, LLC. That "current BPL devices are communicating at speeds much faster than that available from DSL and cable modem systems today".

While the above statement is probably true, the speed that BPL uses must be shared with lots of customers along the same mid-voltage power line that can service average 10,000 customers. Such 5-10 Mbps throughput speed will be too low speed (lower then dial up) to serve even 10% of those customers. Consequently, the current BPL devices are not ready for large scale operations and with the tremendous noise they cause to other licensed users, those devices must be redesigned to meet the new proposed FCC regulations from day one and not be allowed for extension of time to retire them. BPL will need several 100 Mbps throughput speed or rather several Gbps speed to satisfy large scale operation. Satius has the technology to reach several Gbps and the patents to support the same.

V. Conclusion

For the reasons discussed above, Satius recommends that the Commission establish frequency limit standards for Access BPL Systems and In-House BPL Systems which are equivalent to current wire and wireless systems as discussed and which promote the deployment of BPL as an alternative, competitive broadband solution.

The proposed FCC rules must be enforced immediately after its finalization and FCC should field test all BPL technologies immediately to avoid security breaches.

Respectfully submitted,

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